

XXIII. *On a collection of Heliconine forms from French Guiana.* By J. J. JOICEY, F.E.S., and W. J. KAYE, F.E.S.

[Read November 1st, 1916.]

PLATES CVII, CVIII.

THE following account is concerning a collection made during the months July, August and September, 1915, between the places St. Jean and St. Laurent on the Maroni river in French Guiana. The distance between the two places is about twelve miles or rather less, and the distance of St. Laurent (the nearer place) from the coast is about twenty miles. The collection, which contained numbers of specimens of other families, was, however, chiefly remarkable for the vast number and variety of forms of *Heliconius melpomene* and *Heliconius erato*. A few other species of *Heliconius* were obtained, but only a very few specimens of each. The other species were *Heliconius egeria*, *H. numata*, *H. silvana*, *H. xanthocles*, *H. antiochus*, *H. burneyi*, *H. doris*, *H. aede*, *H. sara*, and *H. wallacei*. The whole collection was not undertaken for a special scientific diagnosis, and in classifying the material of *Heliconius melpomene* it is necessary to state that a number of typical *melpomene*\* were rejected by the collectors. It has been estimated that something like a further 25† typical *melpomene* could have been taken during the three months. As it is, there are 731 specimens, which show a most wonderful range of variation. Many forms are new, and others graduate completely into these as well as to all the other known forms that have ever come from French Guiana. The following described forms are all contained in the series—*melpomene*, Linn., *atrosecta*, Riff., *lucia*, Cram., *lucinda*, Riff., *melpomenides*, Riff., *funeris*, Moesch., *cybele*, Cram., *hippolyte*, Bates, *tyche*, Bates, *thelxiope*, Hübn., *thelxiopeia*, Stgr., *faustina*, Stgr., *eulalia*, Riff., *deinia*, Moesch., *melanippe*, Riff.

\* Including some identically coloured forms of the companion species *erato*.

† Very uncertain, but probably not more.

In order to arrive at some scheme for classifying this large amount of material, we have primarily divided up the forms into those with a black hind-wing, or the true *melpomene* type (125 specimens); those with a red basal streak to the hind-wing, or the *cybele* type (420 specimens); and those with the basal streak and cross streaks, or the *thelxiope* type (186 specimens).

As there are already so many named forms of *Heliconius melpomene*, it may be questioned by some as to the value of naming still more forms. But this can be decided satisfactorily if one applies the question: Are the forms recurrent, well marked, and perhaps of subspecific rank? If so, we maintain they should be named. Of the forms which we figure on Plate CVII, numbers 1, 4, 5, 6 are certainly terminal developments and well worthy of names. If one accepts the three principal divisions or subspecies based on the colouring of the hind-wing, viz. black hind-wing, *melpomene melpomene*; black basal streak, *melpomene cybele*; and black basal streak with flame streaks, *melpomene thelxiope*, it follows that for each named form (by fore-wing) of one, there are probably parallel forms in the other two hind-wing divisions. Thus *melpomenides*, with a black hind-wing, has its parallel in *dianides*, with the hind-wing red basal streak, and in *hippolyte* with the fully streaked hind-wing. Although, perhaps, every parallel form to other aberrations has not yet been described or detected, it is more or less certain to occur, and should, therefore, be described when found. The form *eltringhami*, which we have described later, is treated as a new subspecies, and while of extraordinary interest as having occurred in the Guiana region, it is no doubt extremely rare in that country and little more than a rare chance aberration. But in some locality further south it is likely that the type is more fixed, as in East Bolivia and South Brazil a yellow-banded hind-wing form of *melpomene* is the usual type.

Appended are descriptions of three new forms in the section, with black hind-wing.

***Heliconius melpomene melpomene* ab. *collis*, nov.**

(Plate CVII, fig. 3.)

Fore-wing black with a red band of half the width of typical *melpomene* and similar to *melpomenides*. It is edged on its inner

edge as far as vein 4 with yellow. A yellow spot is also on the inner edge of the band between veins 2 and 3. A large conspicuous squarish yellow patch within the cell just beyond the middle. Hind-wing black as in typical *melpomene*.

*Habitat.* FRENCH GUIANA, Nouveau Chantier.

*Type* in coll. Joicey.

This form is figured in Seitz under the name of *lucia*, Cram., but Cramer's figure shows a different form with a broader red band, and without yellow on the inner edge except for a little spot near costa. There is also a curious small yellow mark at the base of the fore-wing in Cramer's figure, which is a characteristic of true *lucia*. This short yellow streak is doubtless the residuum of the red basal streak present in all *cybele* forms. Seitz probably copied the error of identification of *lucia* from Riffarth, who was evidently unacquainted with Cramer's figures on Pl. 350.

***Heliconius melpomene melpomene* ab. *primus*, nov.**

(Plate CVII, fig. 1.)

Fore-wing like *melpomene*, except for a conspicuous trapezoidal yellow blotch in the cell slightly beyond the middle, and contiguous with the inner margin of the red transverse band, which is almost the same as in typical *melpomene*.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

This fine form is reminiscent of the Bolivian aberrational form *aphrodyte*, except that *primus* has the red and yellow sharply defined, while in *aphrodyte* the colours coalesce. In *primus* also the red band is considerably wider.

***Heliconius melpomene melpomene* ab. *melpina*, nov.**

Fore-wing black, with a group of yellow spots arranged as in *thelxiope*, edged externally with a narrow red band from costa to vein 3. Hind-wing black.

*Habitat.* FRENCH GUIANA, St. Laurent.

*Type* in coll. Joicey.

This form is the equivalent of *faustina*, but with a black hind-wing.

Of the 125 specimens with a totally black hind-wing there is a complete transition between *melpomene* and

*melanippe*, the latter a rare form in which only the yellow *thelxiope* group of spots remains on the fore-wing. It is figured by Oberthür (Études d'Ent., xxi, Pl. 5, fig. 58). Of *melpomenides* (figured by Oberthür, loc. cit., Pl. 4, fig. 46 and Pl. 5, fig. 50) there are eighteen specimens, and barely half the number of true *melpomene*, viz. eight. Of *primus* which we figure (Pl. CVII, fig. 1) there are only two specimens, with some seven intermediates graduating to typical *melpomene*. Of *lucinda* there are also only two specimens that are typical, but there are some eighteen intermediate forms to *lucia*. Of *collis* which we figure (Pl. CVII, fig. 3) there are but three typical forms with the intermediate specimens to *melanippe*. The whole can be grasped better in tabulated form.

SECTION A (*specimens of melpomene with a wholly black hind-wing*—125):—

<i>melpomene</i> , Linn.	. . . . .	8
intermediates	. . . . .	7
<i>primus</i> , J. and K.	. . . . .	2
intermediates	. . . . .	—
<i>atrosecta</i> , Riff.	. . . . .	5
intermediates	. . . . .	—
<i>melpomenides</i> , Riff.	. . . . .	18
intermediates	. . . . .	37
<i>lucinda</i> , Riff.	. . . . .	2
intermediates	. . . . .	18
<i>lucia</i> , Cram.	. . . . .	3
intermediates	. . . . .	11
<i>collis</i> , J. and K.	. . . . .	3
intermediates	. . . . .	9
<i>melpina</i> , J. and K.	. . . . .	1
<i>melanippe</i> , Riff.	. . . . .	1
Total of forms with a wholly black hind-wing		125

SECTION B (*hind-wing with red basal streak*).—Of the forms with a short red basal streak to the hind-wing there are 420 specimens. These have the streak of variable size, some showing a suffusion over the lower and outer half with black scaling. But the hind-wing red markings are discussed later. The 420 specimens in this section divide up mainly into three principal groups—(1) The *diana*, *dianides* group; (2) the *deinia*, *faustina* group; (3) the *cybele* group. These contain the following numbers of examples each—(1) 89, (2) 79, (3) 51. Both *diana*

and *cybele* are the most fixed and definite races of this section, the former giving fifty-five nearly typical examples, and the latter fifty-one examples. Of *funebis*, of which there are only four completely typical examples without any trace of markings beyond the red basal area to the fore- and hind-wing, there are interesting examples showing that *funebis* is an extreme development of both *cybele* and *diana*. Of the new forms *negroida*, *maris*, *elegantula*, *faustalia* and *dianides*, the last is doubtless well known but hitherto undescribed, but the remaining four, we think, have probably never been seen before. *Elegantula* is at once a development out of *lucinda*, and *faustalia* a development of *eulalia*. *Negroida* is a striking aberration, and quite unlike any already described form. It must be looked upon as a parallel development to *deinia*, but suffused heavily with black. *Maris* is a perfectly natural advance on *lucia* as figured by Cramer (vol. iv, Pl. 350, fig. E), being simply the addition of the red base to fore- and hind-wing. We are surprised that no intermediate forms are available, showing either a red fore-wing base only or a red hind-wing base only. The two red areas are always present together, and this is the only phase of variation where connecting forms are not to be found.

Unquestionably the most interesting form is the one we name *eltringhami* in honour of Dr. Eltringham, who has recently advanced our knowledge of the genus *Heliconius* by his researches. This form, of which we have but one specimen, is connected by two other forms to a more or less typical *deinia*. One of these specimens is a *deinia* form, but with the hind-wing basal stripe half red and half yellow, the outer half being yellow. In the other specimen, which is of the *cybele* type with the yellow spotting very much reduced, only just the tip of the transverse red streak is yellow.

The aberrations which we herein describe appear to be terminal developments in different directions, and as such should be named, because it is possible and quite likely that in certain localities these may have become races of at least subspecific rank. In every instance except *eltringhami* there are two or more identical specimens, thus proving that these forms are recurrent, and there are series of graduating specimens leading up to these types.

***Heliconius melpomene cybele* ab. *elegantula*, nov.**

Fore-wing black with the base red, and extending nearly half-way across the cell. A broad red band from costa to near tornus, edged broadly internally with yellow as far as vein 2. Some suffused yellowish scales extending inwards across the cell. Hind-wing black with a red basal streak.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

This form is analogous to *lucinda*, and may be described as a *lucinda* with a red basal area to both fore-wing and hind-wing.

***Heliconius melpomene cybele* ab. *faustalia*, nov.**

Fore-wing black with the base red, extending half-way across the cell. A large yellow patch surrounding the crescent-shaped black discoidal spot, similar to *H. melpomene penelope*. On the outer margin of the patch between the costa and vein 3 is a broad edging of red. Hind-wing black with a red basal streak.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

This rare form, of which there is but a single\* specimen, is a red-edged *eulalia*, Riff., also a rare form. The solid yellow fore-wing patch, such as is found in the common Bolivian form *penelope*, appears to be very rare in French Guiana, but with the intermediates it is clearly only a closing up of the open patch of *cybele*.

***Heliconius melpomene cybele* ab. *dianides*, nov.**

(Plate CVII, fig. 7.)

Fore-wing black, with a very narrow red transverse band wholly outside the cell. The base red. A small yellow mark on the inner edge of the red band just below costa. Hind-wing black with red basal streak.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

This form is equal to a *melpomenides*, with the addition of red base to fore- and hind-wing.

Every gradation occurs between *diana* and *dianides*.

\* A second specimen of this form was already in the Hill Museum.

Of the fifty-five forms placed under the former, some thirteen show a slight reduction of the band, but still classed as *diana*, while a further seventeen are wholly intermediate between *dianides* and *diana*.

***Heliconius melpomene cybele* ab. *maris*, nov.**

(Plate CVII, fig. 4.)

Fore-wing like *diana*, Riff., with a broad transverse band like *melpomene* and a red basal patch. Within the cell is a well-defined yellow squarish spot. Hind-wing black with red basal streak.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

Except for the red base to fore- and hind-wing, this form is similar to *primus*.

Four specimens have a clear yellow spot of varying size, without any dark suffusion. Fourteen show more or less black suffusion, and nine have only a rudimentary yellowish mark within the cell.

***Heliconius melpomene cybele* ab. *negroida*, nov.**

(Plate CVII, fig. 2.)

Fore-wing red at base, with a prominent wedge of black pointing to base and occupying more than half the cell. Beyond the cell is a half band of long yellow spots heavily suffused with black from costa to vein 4; externally this half band is edged with red of the same colour as the base. Between veins 3 and 4 is patch of yellowish scales mixed with black and edged with a small mark of red. Hind-wing black, with a red streak at base considerably suffused with black scaling.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

***Heliconius melpomene eltringhami*, nov.**

(Plate CVII, fig. 6.)

Fore-wing with the basal area black, but with a very short inconspicuous yellowish streak. A red transverse band almost as wide and of similar pattern as in typical *melpomene*. Lying wholly within the cell is a large squarish yellow blotch, which is contiguous with the red transverse band only at vein 2; above it is separated by the dark ground-colour; on the costa is a small yellow mark on edge of transverse red band. Hind-wing black, with the base

black except for a few stray yellow scales as far as vein 2; beyond as far as vein 7 is a yellow band considerably suffused with black scaling on the portion within the cell, and with the veins showing plainly black scaled.

*Habitat.* FRENCH GUIANA, St. Laurent de Maroni.

*Type* in coll. Joicey.

This specimen, apart from its strange colouring, has a peculiar aspect in the apical third of the wing. It there has a whitish appearance, caused by a regular and symmetrical loss of scales. We have not had this shown in the figure, for it is most probable that when the insect was fresh, no such loss of scales was to be detected. The specimen is far from fresh, and we have thought it best to figure it as normally scaled.

#### TABLE OF FORMS WITH A RED BASAL STREAK TO HIND-WING.

(Numbers in brackets are intermediate forms, and their positions show the types which they unite.)

		ab. <i>diana</i> , Riff.	55
		(17)	
		ab. <i>dianides</i> , J. and K.	17
		(23)	
		ab. <i>negroida</i> , J. and K.	5
		(27)	
		ab. <i>funebria</i> , Moesch.	1
		(23)	
		ab. <i>maris</i> , J. and K.	3
		(8)	
		ab. <i>funebria</i> , Moesch.	1
		(12)	
	ab. <i>elegantula</i> , J. and K. 2	(13) ab. <i>deinia</i> , Moesch.	24
		(24)	
		ab. <i>faustina</i> , Stgr.	31
		(33)	
ab. <i>faustalia</i> , J. and K. }	1	ab. <i>eulalia</i> , Riff. 2	51
		(45)	
		ab. <i>funebria</i> , Moesch.	2

1	+	4 + 13	+	212	+	190
420						

#### VARIATION OF THE HIND-WING.

It has already been shown how the forms divide up primarily into three sections: (1) A black hind-wing, 125 examples; (2) a red streak at base, 420 examples; (3) a completely streaked hind-wing, 186 examples; thus

the intermediate forms with only a red streak at base far outnumber the forms in (1) and (3) together. Whether the fully streaked form or whether the plain black hind-wing was the earlier it is difficult to say. But from the greater general distribution of non-streaked forms to streaked forms, it would appear that the totally streaked form was the later development.

The first step in the development of colour to the hind-wing is a small red spot at the base, below the median vein. This is only present in a single example, a specimen (of the *melpomenides* type), Pl. CVIII, fig. 1. The next stage of development is curious, and suggests that progressive development might be working in an opposite direction, and that the red basal area might be tending to becoming reduced. The red basal spot is surrounded with black, and red appears again below it as a narrow belt. This black dividing the red basal spot from the remainder of the red streak is very persistent and appears in all stages of development of the red streak, but is hardly discernible in the fully developed basal streak, and then only rarely. From the short basal streak the development is outwards into the cell, but suffused with black scaling over the outer half, the suffusion always appearing diagonally across the red in the cell. A stage later is a sharply cut diagonally red basal streak, and in the majority of *cybele* specimens we see the fullest development of the streak where it is still slightly cut diagonally, but more often has its lower edge horizontal and at right angles with the abdomen.

An interesting phenomenon is that the red basal area of the fore-wing is practically an invariable accompaniment to the short red basal streak to the hind-wing. From the evidence of those specimens that show a single red spot at the base of the hind-wing, and at the same time no red on the base of the fore-wing, it appears reasonable to suppose that the red of the base of the hind-wing was antecedent to the red basal area of the fore-wing. But from the very constant appearance of both simultaneously, it is probable that the red base of the fore-wing was a nearly contemporary development to the red base of the hind-wing. In this connection it is interesting to recall the Ecuadorean form of *melpomene* named *contiguus*, in which the flame-streaks of the hind-wing are present alone, without the red basal area of fore-wing or red basal streak

of hind-wing. This form is most likely a later development to the *thelxiope* full streaking, the red basal area of fore- and hind-wing being suppressed. This is a likely explanation, as it is to be seen that in this, as in all streaked forms, on the underside the flame-pattern is very greatly reduced; this also lending support to the theory advanced already, that the long slender streaks are a subsequent development to the wide streaks. But material from East Ecuador is not plentiful enough in collections to at present decide, and a large collection, such as we have examined from Cayenne, is much to be desired.

A quite different phase of variation of the hind-wing is a change from a red band to a yellow band. This is a very rare form of variation in French Guiana, and only three specimens show this transition. One has the red transverse band just tipped with suffused yellowish at the apex. The second specimen is nearly half red and half yellow, the outer yellowish half being suffused with blackish, while the inner red half shows a trace of yellow. The last specimen has a wholly yellow band, but still suffused with some dark scaling about the middle. At the base the band is completely obliterated with the ground-colour.

SUMMARY OF FORMS TOWARDS A RED HIND-WING BASAL STREAK.

Single red spot.	Small broken red basal area.	Short basal streak.	Longer streak suffused outwardly.	Entire streak.
1	4	75	64	271

420

SECTION C (*forms with basal streak and flame streaks*).—

The next stage of development from the red basal streak is the appearance of either long, very narrow streaks, or of a row of suffused spots. It is possible that the very narrow, almost linear streaking, is a subsequent phase to the full nail-headed streaking. It is clear that development from a row of spots is the more usual, but perhaps not the only method. Specimens show every gradation, from a faint indication of spots to larger and better-defined spots, then to short tapering streaks, and finally to the full-length streaking as is seen in *thelxiope*.

There are no examples showing very short linear streaks, or specimens showing linear spots. As is usually the case with Guiana forms of *thelxiope*, a large percentage show an imperfectly developed and modified streaking to the hind-wing, the streaks not being heavily nail-headed but slender. No less than 107 specimens (of various fore-wing types) show less than the full-width streaking of *thelxiope*. Of fully streaked examples, as in typical *thelxiope*, there are no more than twenty-one specimens, and these are to be found chiefly among the actual specimens of *thelxiope*, though two of the *tyche* type are about as heavily marked.

TABLE OF FORMS TOWARDS FULL *thelxiope* HIND-WING STREAKING IRRESPECTIVE OF FORE-WING PATTERN.

A row of spots.	Spots wedge-shaped.	Spots become short streaks.	Streaks heavy but not full length.	Full streaks like <i>thelxiope</i> .
7	13	9	29	21

79

TABLE OF FORMS TOWARDS A REDUCED (LINEAR) STREAKING.  
See Pl. CVIII, figs. 1a, 2a, 3a.

Short linear streaks.	Long linear streaks.
6	101

107

Total 79 + 107 = 186

Appended are descriptions of four new forms with "*thelxiope*" hind-wing streaking.

***Heliconius melpomene thelxiope* ab. *punctarius*, J. and K., nov.**  
(Plate CVII, fig. 5.)

Fore-wing like *maris*, with the base red, and with a rather narrow transverse red band. Within the cell, just beyond the middle, is a large triangular clear yellow blotch having its base attached to the costal vein; the outer side just touching the transverse band, and the inner edge is bordered with heavy black. Hind-

wing like *thelxiope*, with a red basal streak and six large radiating streaks.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

There are three specimens more or less approaching this type, showing the yellow spot considerably suffused.

A further three specimens show both the yellow spot and the transverse red band much suffused and reduced in size.

***Heliconius melpomene thelxiope* ab. *lucindella*, J. and K., nov.**

Fore-wing black, with the base red, deeply divided with black within the cell and just above inner margin. A transverse curved narrow red band beyond the cell from costa, similar to *melpomenides* and deeply edged with yellow from vein 6 to vein 2. Hind-wing like *thelxiope*, with fine pointed streaks and a basal streak.

*Habitat.* FRENCH GUIANA, St. Jean de Maroni.

*Type* in coll. Joicey.

This form is like a *lucia*, Cram., but with a *thelxiope* hind-wing.

***Heliconius melpomene thelxiope* ab. *majestica*, J. and K., nov.**

Fore-wing black, with a narrow red post-median band like *melpomenides*, internally edged from vein 4 to costa with yellow, and a large yellow spot between veins 2 and 3 on the inside of the red band. A large irregular squarish yellow spot within the cell. Hind-wing with a basal red streak and five heavy flame streaks. The fore-wing is like *melpomene collis*, and the hind-wing like *thelxiope*.

*Habitat.* FRENCH GUIANA, Nouvean Chantier.

*Type* in coll. Joicey.

***Heliconius melpomene thelxiope* ab. *stygianus*, J. and K., nov.**

Fore-wing entirely black except for red basal area. Hind-wing black with red basal streak and slender flame streaks.

*Habitat.* FRENCH GUIANA, St. Jean.

*Type* in coll. Joicey.

This form is analogous to *funnebris*, Moesch, in which there is only the red base to fore- and hind-wing.

## TABLE OF FORMS WITH BASAL STREAK AND VARIABLE FLAME STREAKS TO HIND-WING.

(Numbers in brackets are intermediate forms, and their position show the types which they unite.)

ab. <i>punctarius</i> , J. and K.	1	ab. <i>tyche</i> , Bates	1
		(18)	
ab. <i>lucindella</i> , J. and K.	1	ab. <i>hippolyte</i> , Bates	2
		(19)	
		ab. <i>majestica</i> , J. and K.	3
		(25)	
ab. <i>vicinus</i> , } Ménét }	1	ab. <i>rufolimbata</i> Butl.	1
		(7)	
		ab. <i>thelxiope</i> , Hüb.	7
		(23)	
		ab. <i>thelxiopeia</i> , Stgr.	23
		(16)	
		ab. <i>aglaopeia</i> , Stgr.	6
		(15)	
		ab. <i>stygianus</i> , J. and K.	2
<hr/>			
1	+	3	+
		122	+
		60	
<hr/>			
Total 186			

## KEY SHOWING THE SAME VARIATION OF FORE-WING IN THE THREE PHASES OF THE HIND-WING.

Black hind-wing.	Hind-wing with basal streak.	Hind-wing with red basal and flame streaks.
<i>melpomene</i>	<i>diana</i>	<i>tyche</i>
<i>primus</i>	<i>maris</i>	<i>punctarius</i>
<i>melpomenides</i>	<i>dianides</i>	<i>hippolyte</i>
<i>lucinda</i>	<i>elegantula</i>	<i>lucindella</i>
<i>lucia</i> }	<i>deinia</i>	<i>majestica</i>
<i>collis</i> }	<i>negroida</i>	<i>negroidens</i> *
—	<i>faustina</i> }	<i>augusta</i>
<i>melpina</i>	<i>karschi</i> }	<i>thelxiope</i> }
<i>melpanippe</i>	<i>cybele</i>	<i>thelxiopeia</i> }
—	<i>eulalia</i>	<i>vicinus</i>
—	<i>faustalia</i>	<i>rufolimbata</i>
—	—	<i>aglaopeia</i>
—	<i>funnebris</i>	<i>stygianus</i>

\* ab. *negroidens*, nov. J. and K., forewing as in *negroida*, hind-wing as in *thelxiope*.





Adlard & Son and West, Newman chr.

NEW EUEIDES AND FORMS OF *HEL. MELPOMENE*.

## EXPLANATION OF PLATE CVII.

Hind-wings of *Heliconius melpomene* forms.

Development of *thelxiope* hind-wing pattern from a black *melpomene* hind-wing (1-12).

Development of *thelxiope* hind-wing to *thelxiopeia*-pattern hind-wing (1a-1c).

- |     |   |
|-----|---|
| 1a. | Hind-wing of <i>H. thelxiope</i> , ♂.             |
| 1b. | „ „ „ <i>majestica</i> , ♀, near.                 |
| 1c. | „ „ „ <i>augusta</i> , ♀.                         |
| 12. | „ „ „ <i>majestica</i> , ♂.                       |
| 11. | „ „ „ <i>agaopeia</i> , ♂.                        |
| 10. | „ „ „ <i>thelxiope</i> , ♂, near.                 |
| 9.  | „ „ „ ab., ♂, <i>cybele-funebris</i> , fore-wing. |
| 8.  | „ „ „ <i>augusta</i> , ♂, near.                   |
| 7.  | „ „ „ <i>augusta</i> , ♂, near.                   |
| 6.  | „ „ „ <i>cybele</i> , ♀, near.                    |
| 5.  | „ „ „ <i>cybele</i> , ♂.                          |
| 4.  | „ „ „ <i>faustina</i> , ♀.                        |
| 3.  | „ „ „ <i>faustina</i> , ♂.                        |
| 2.  | „ „ „ <i>diana</i> , ♂.                           |
| 1.  | „ „ „ <i>melpomenides</i> , ♂.                    |

## EXPLANATION OF PLATE CVIII.

1. *Heliconius melpomene melpomene*, ab. *primus*.
2.     "                 "     *cybele*, ab. *negroida*.
3.     "                 "     *melpomene*, ab. *collis*.
4.     "                 "     *cybele*, ab. *maris*.
5.     "                 "     *thelxiope*, ab. *punctarius*.
6.     "                 "     *eltringhami*.
7.     "                 "     *cybelz*, ab. *dianides*.
8. *Eueides egeriformis*.
9.     "                 "     hind-wing underside.



1a.



2a.



3a.



12.



11.



10.



9.



8.



7.



6.



5.



4.



3.



2.



1.

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HIND WING DEVELOPMENT OF *HEL. MELPOMENE*.



*H. silvana*; there are a pair of this species, rather heavily marked with black, but otherwise typical.

*H. numata*, Cram.; the material in this species is curiously limited to six specimens, but they are of great interest. One is nearly typical *numata*; two are ab. *melanops*, Riff.; one is ab. *mavors*, and two are of an undescribed unicolorous form, analogous to *mavors* but with a heavy undivided black hind-wing like *melanops*. For this interesting form we propose the name *melanopors*, nov. The occurrence of these unicolorous forms in Cayenne is exceedingly interesting, and makes one wonder if there is any possibility of the Peruvian *aristiona*, in its varying phases, being a form only of *numata*.

## HELICONINE SPECIES IN THE COLLECTION OF GROUP II.

Of the remainder of the *Heliconius* in the collection there are the following:—

*Heliconius egeria egeria*, Cram., five fine perfectly typical examples.

*H. xanthocles vala*, Stgr.; six specimens, all ♀, as is so frequently the case in all the races of this species. One of these specimens is remarkable on the underside. It has all the red streaks greatly widened, and almost touching the veins alone separating them. At the margins of the rays there is a considerable amount of black suffusion, giving the streaks the appearance of feathers. Above, the specimen is normal, except for a pale whitish area just below the median within the red area.

*H. antiochus alba*, Riff.; nine specimens, all somewhat intermediate between *alba* and typical *antiochus*, but certainly nearer *alba*.

*H. doris*; nine specimens. Six of the *delila* form; one a *delila* but heavily suffused with black, and two of the *amathusia* type, being really of the *metharmina* type with three in one case, or four red streaks running through.

*H. aoede aoede*; one small male specimen with rather slender hind-wing streaking. In view of the large number of *melpomene* forms with slender hind-wing streaking, it must be presumed that the influence extends to *H. aoede*, which is very much scarcer, and that it is, therefore, a mimic of *H. melpomene thelxiopeia*.

In comparison with the very large number of *melpomene* specimens the number of *erato* forms is small, being only  
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